

JUNIOR CERTIFICATE EXAMINATION, 2002

MATERIALS AND TECHNOLOGY

METALWORK - ORDINARY LEVEL

100 Marks

Tuesday, 18 June, Afternoon, 2.00 to 3.30

Centre Number 

Examination Number 

For Examiner	
Total Mark	<input type="text"/>
Question	Mark
1A	
1B	
2	
3	
4	
5	
6	
Total	
Grade	

INSTRUCTIONS

1. Answer question 1, sections **A and B**, and **any three** other questions.
2. Write your answers in the spaces provided or tick the appropriate box.
3. Hand up this paper at the end of the examination.


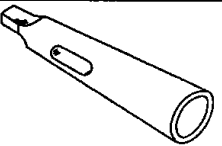

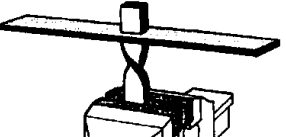


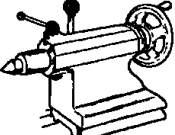
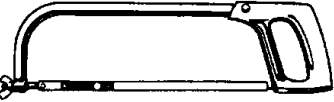
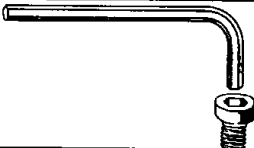
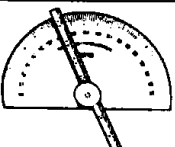

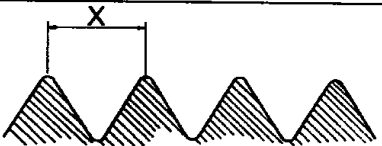
1. Total of end of page totals	
2. Aggregate total of all disallowed question(s)	
3. Total mark awarded (1 minus 2)	
4. Bonus mark for answering through Irish (if applicable)	
5. Total mark awarded if Irish Bonus (3+4)	
Note: The mark in row 3 (or row 5 if an Irish Bonus is awarded) must equal the mark in the Total Mark box on the script	

MAKE SURE TO WRITE YOUR EXAMINATION NUMBER IN THE BOX PROVIDED ON THIS PAGE

1.


SECTION A - 20 MARKS
ANSWER ANY TEN QUESTIONS FROM THIS SECTION

40 Marks

<p>(a)</p> 	<p><i>This cutting tool is a:</i></p>	<table border="1"> <tr><td>Curved Snips</td><td></td></tr> <tr><td>Straight Snips</td><td></td></tr> <tr><td>Universal Snips</td><td></td></tr> <tr><td>Bench Shears</td><td></td></tr> </table>	Curved Snips		Straight Snips		Universal Snips		Bench Shears	
Curved Snips										
Straight Snips										
Universal Snips										
Bench Shears										
<p>(b)</p> 	<p><i>This tool is used when :</i></p>	<table border="1"> <tr><td>Riveting</td><td></td></tr> <tr><td>Drilling</td><td></td></tr> <tr><td>Threading</td><td></td></tr> <tr><td>Soldering</td><td></td></tr> </table>	Riveting		Drilling		Threading		Soldering	
Riveting										
Drilling										
Threading										
Soldering										
<p>(c)</p> 	<p><i>This soldering iron bit is made from:</i></p>	<table border="1"> <tr><td>Brass</td><td></td></tr> <tr><td>Copper</td><td></td></tr> <tr><td>Lead</td><td></td></tr> <tr><td>Steel</td><td></td></tr> </table>	Brass		Copper		Lead		Steel	
Brass										
Copper										
Lead										
Steel										
<p>(d)</p> 	<p><i>This technique is called:</i></p>	<table border="1"> <tr><td>Scrolling</td><td></td></tr> <tr><td>Forming</td><td></td></tr> <tr><td>Twisting</td><td></td></tr> <tr><td>Bending</td><td></td></tr> </table>	Scrolling		Forming		Twisting		Bending	
Scrolling										
Forming										
Twisting										
Bending										
<p>(e)</p> 	<p><i>This scribe is made from:</i></p>	<table border="1"> <tr><td>Mild Steel</td><td></td></tr> <tr><td>Cast Iron</td><td></td></tr> <tr><td>High Carbon Steel</td><td></td></tr> <tr><td>Tin</td><td></td></tr> </table>	Mild Steel		Cast Iron		High Carbon Steel		Tin	
Mild Steel										
Cast Iron										
High Carbon Steel										
Tin										
<p>(f)</p> 	<p><i>This tool is a:</i></p>	<table border="1"> <tr><td>Die Stocks</td><td></td></tr> <tr><td>Tap Wrench</td><td></td></tr> <tr><td>Split Die</td><td></td></tr> <tr><td>Taper Tap</td><td></td></tr> </table>	Die Stocks		Tap Wrench		Split Die		Taper Tap	
Die Stocks										
Tap Wrench										
Split Die										
Taper Tap										
<p>(g)</p> 	<p><i>This lathe part is a:</i></p>	<table border="1"> <tr><td>Headstock</td><td></td></tr> <tr><td>Tailstock</td><td></td></tr> <tr><td>Centre</td><td></td></tr> <tr><td>Carriage</td><td></td></tr> </table>	Headstock		Tailstock		Centre		Carriage	
Headstock										
Tailstock										
Centre										
Carriage										
<p>(h)</p> 	<p><i>Hacksaw blades are made from:</i></p>	<table border="1"> <tr><td>Mild Steel</td><td></td></tr> <tr><td>Stainless Steel</td><td></td></tr> <tr><td>High Speed Steel</td><td></td></tr> <tr><td>Cast Iron</td><td></td></tr> </table>	Mild Steel		Stainless Steel		High Speed Steel		Cast Iron	
Mild Steel										
Stainless Steel										
High Speed Steel										
Cast Iron										
<p>(i)</p> 	<p><i>This tool is a(n):</i></p>	<table border="1"> <tr><td>Box Spanner</td><td></td></tr> <tr><td>Ring Spanner</td><td></td></tr> <tr><td>Allen Key</td><td></td></tr> <tr><td>Open Spanner</td><td></td></tr> </table>	Box Spanner		Ring Spanner		Allen Key		Open Spanner	
Box Spanner										
Ring Spanner										
Allen Key										
Open Spanner										
<p>(j)</p> 	<p><i>This instrument is a(n):</i></p>	<table border="1"> <tr><td>Thread Gauge</td><td></td></tr> <tr><td>Feeler Gauge</td><td></td></tr> <tr><td>Engineers Protractor</td><td></td></tr> <tr><td>Wire Gauge</td><td></td></tr> </table>	Thread Gauge		Feeler Gauge		Engineers Protractor		Wire Gauge	
Thread Gauge										
Feeler Gauge										
Engineers Protractor										
Wire Gauge										
<p>(k)</p> 	<p><i>Part 'X' is called the:</i></p>	<table border="1"> <tr><td>Sleeve</td><td></td></tr> <tr><td>Thimble</td><td></td></tr> <tr><td>Frame</td><td></td></tr> <tr><td>Ratchet</td><td></td></tr> </table>	Sleeve		Thimble		Frame		Ratchet	
Sleeve										
Thimble										
Frame										
Ratchet										
<p>(l)</p> 	<p><i>The distance 'X' is called the :</i></p>	<table border="1"> <tr><td>Flank</td><td></td></tr> <tr><td>Lead</td><td></td></tr> <tr><td>Pitch</td><td></td></tr> <tr><td>Crest</td><td></td></tr> </table>	Flank		Lead		Pitch		Crest	
Flank										
Lead										
Pitch										
Crest										

SECTION B - 20 MARKS
ANSWER ALL QUESTIONS FROM THIS SECTION

(m)




(ii) How can steel be protected against rust?

(i) Complete the chart by listing a different material for each part:

Part	Material
1. Body	
2. Headlight Lens	
3. Soft Roof	
4. Wheels	

4 Marks

(n)



(i) Truck engines are powered by:

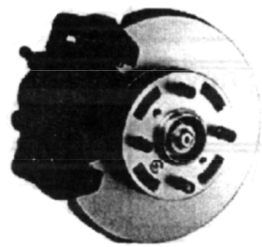
Unleaded Petrol	
Leaded Petrol	
Diesel	
Gas	

(ii) Truck engines are lubricated using:

Oil	
Air	
Water	
Cooling Fluid	

4 Marks

(o)



(i) This is a:

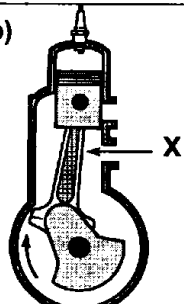
Drum Brake	
Disc Brake	
Stirrup Brake	
Shoe Brake	

(ii) The steam engine was invented by:

Henry Ford	
James Watt	
John P. Holland	
Rudolf Diesel	

4 Marks

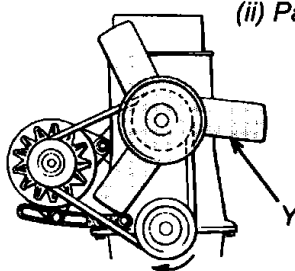
(p)



(i) Part 'X' is called the:

Camshaft	
Connecting Rod	
Piston	
Crankshaft	

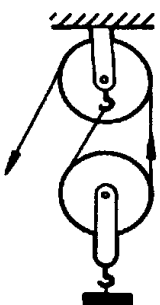
(ii) Part 'Y' is called the:



Fan Belt	
Alternator	
Cooling Fan	
Crankshaft Pulley	

4 Marks

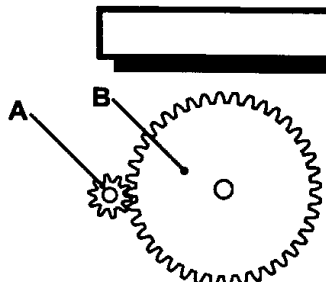
(q)



(i) The load is lifted using:

Levers	
Pulleys	
Gears	
Chain and Sprocket	

(ii) If gear 'A' rotates at 40 RPM, how fast will gear 'B' rotate?
 (A = 10 Teeth, B = 40 Teeth.)



4 Marks

(a) (i) Complete the chart:

Plastic Material	Thermosetting or Thermoplastic	List two uses for each plastic	
PVC	<i>Thermoplastic</i>	(i) <i>Pipes</i>	(ii) <i>Windows</i>
Acrylic		(i)	(ii)
Nylon		(i)	(ii)

(ii) Complete the chart:

Metals	Ferrous or Non - Ferrous	List two uses for each metal	
Brass	<i>Non-Ferrous</i>	(i) <i>Screws</i>	(ii) <i>Door Handles</i>
Mild Steel		(i)	(ii)
Copper		(i)	(ii)

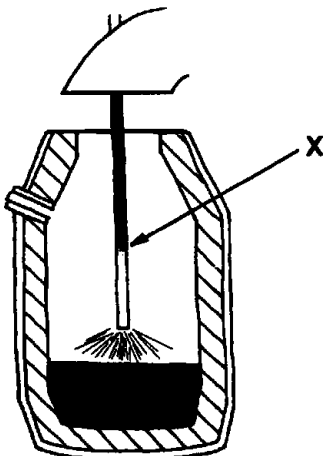
8 Marks

(b) Complete the chart:

(i) Is Lead a hard material?	Yes	
	No	
(ii) Is Iron Ore mined from the ground?	Yes	
	No	
(iii) Is brittleness the ability of a material to resist wear?	Yes	
	No	
(iv) Is Copper a malleable material?	Yes	
	No	
(v) Is Cast Iron produced in the Electric Arc Furnace?	Yes	
	No	
(vi) Are Ferrous metals magnetic?	Yes	
	No	

6 Marks

(c) (i) Name this steel making furnace:



(ii) Part 'X' is called the:

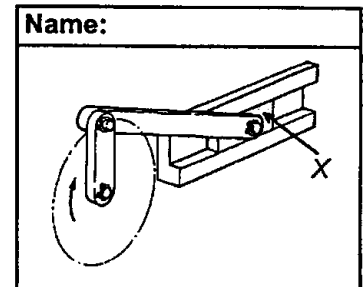
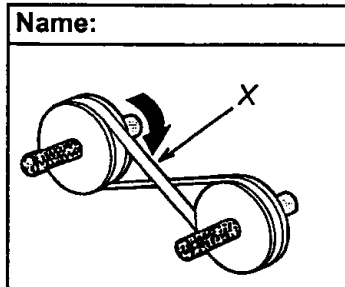
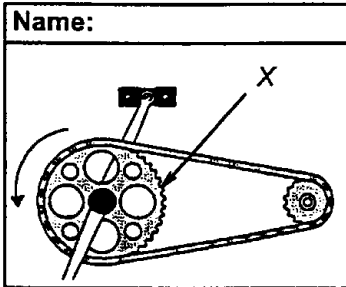
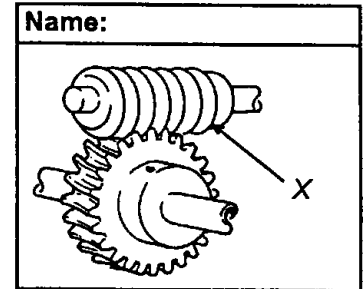
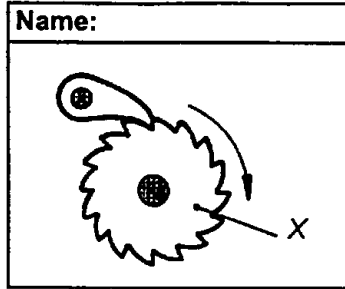
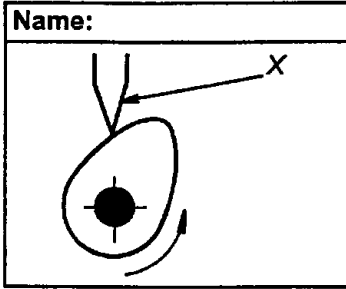
Arc	
Oxygen Lance	
Charge	
Electrode	

(iii) Which one of these metals is an alloy?

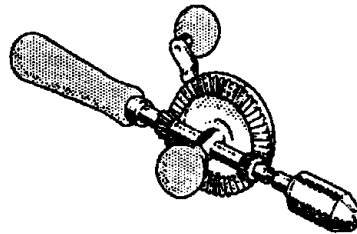
Aluminium	
Zinc	
Bronze	
Copper	

6 Marks

(a) (i) Name the part of the mechanism marked 'X' in each box.



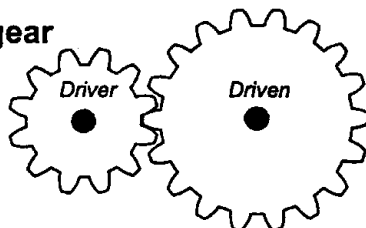
(ii) This hand drill uses:



Spur Gears	
Bevel Gears	
Ratchets	
Pulleys	

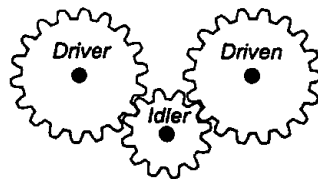
8 Marks

(b) (i) The driven gear rotates:



at the same speed as the driver.	
slower than the driver.	
faster than the driver.	

(ii) The idler gear causes the driven gear to:



rotate in the same direction as the driver.	
go slower.	
go faster.	

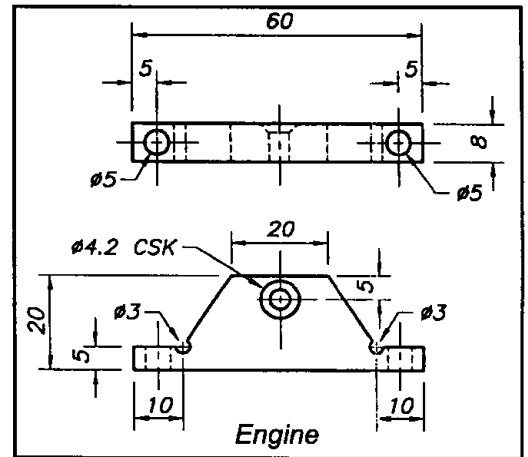
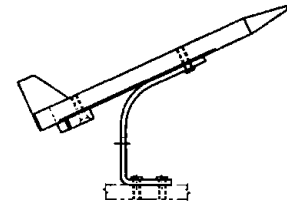
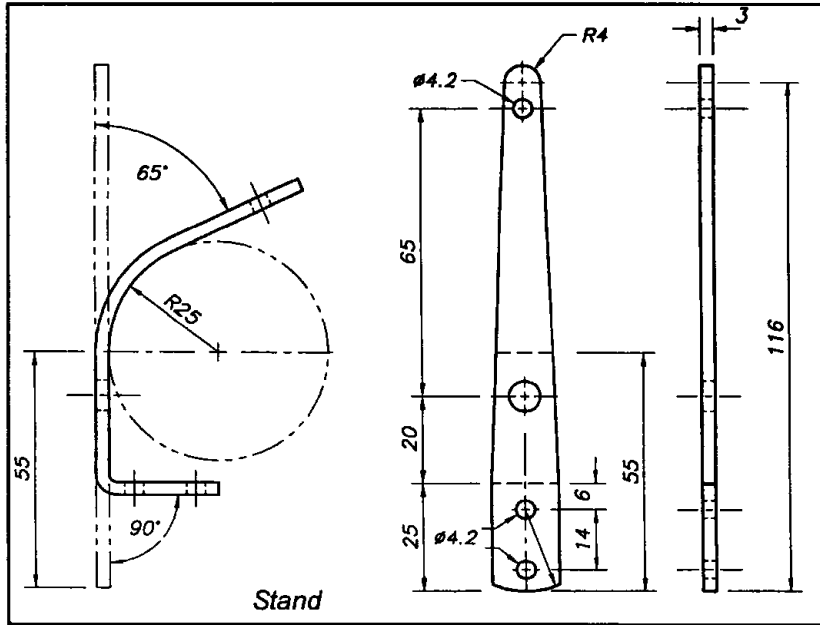
(iii) Name a machine in the school workshop that uses gears:

6 Marks

(c) (i) Complete the chart by naming the inventors:

INVENTION	INVENTOR
1. Pneumatic Tyre	
2. Telephone	
3. Mass Production	
4. Submarine	

Details of a model jet are shown.



(i) State the steps involved in making the stand from a blank piece of metal.

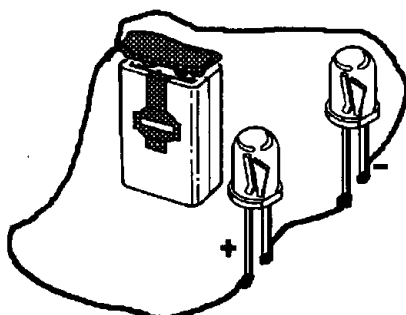
(ii) Briefly explain how the engine is made.

(iii) What does 'CSK' refer to in the drawing of the engine shown above?

(iv) What is the overall width and height of the engine?

(v) What is the difference between a pilot hole and a tapping hole?

(vi) Select the correct symbols from the chart and draw the circuit diagram for the model jet.



Circuit for the model jet.

Symbols	

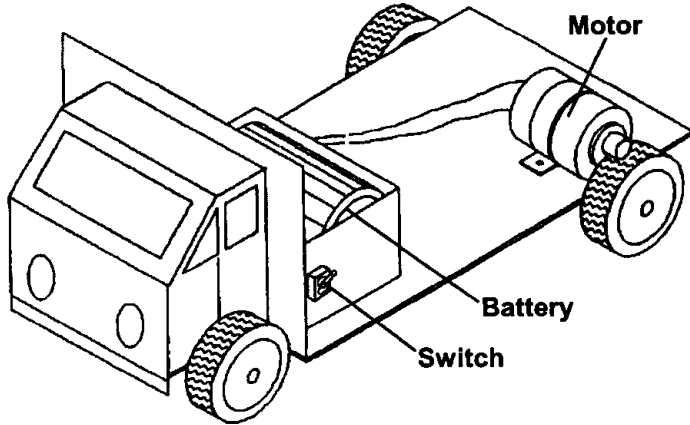
Draw the circuit diagram in this box.

5.

20 Marks

(a) Select the correct symbols from the chart and complete the electrical circuit diagram for this motor driven truck.

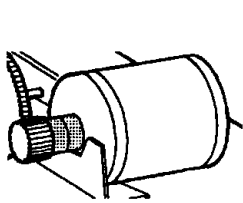
Symbols		



Draw the circuit in this box									

8 Marks

(b) (i) Briefly explain the difference between a motor and a dynamo.

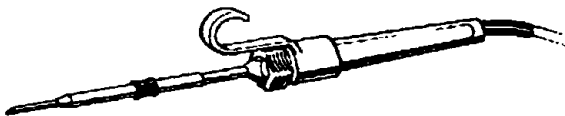


Motor



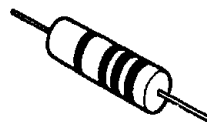
Dynamo

(ii) List two safety precautions to be observed when using an electric soldering iron.



8 Marks

(c) (i) This electronic component is a(n):



Resistor		
LDR		
LED		
Transistor		

(ii) This symbol represents a:



Switch		
Buzzer		
Loudspeaker		
Battery		

4 Marks

